SEQUENCE LISTING

<110> SLINGSBY, JASON
      KINGSMAN, SUSAN
      ROHL, JONATHAN
      SLADE, ANDREW

<120> PRODUCER CELL FOR THE PRODUCTION OF RETROVIRAL VECTORS

<130> 078883-0146

<140> 10/088,076
<141> 2002-03-20

<150> PCT/GB00/03837
<151> 2000-10-05

<150> GB 9923558.2
<151> 1999-10-05

<160> 65

<170> PatentIn Ver. 2.1

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<220>
<223> Description of Artificial Sequence: Primer

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<220>
<223> Description of Artificial Sequence: Primer

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<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

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<220>
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<220>
<223> Description of Artifical Sequence: Primer

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<223> Description of Artificial Sequence: Synthetic
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<220>
<223> Description of Artificial Sequence: Primer

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<210> 8
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<220>
<223> Description of Artificial Sequence: Primer

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<223> Description of Artificial Sequence: Synthetic
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<223> Description of Artificial Sequence: Synthetic
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4

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6

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<210> 11
<211> 56
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 12
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 12
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ctgtggggtt tttatgaggg gttttataaa ctgcaggagt ggggaggcac gatggcc      57
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<210> 13
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<210> 14
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<223> Description of Artificial Sequence: Primer

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<210> 15
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 15
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<210> 16
<211> 98
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 16
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<210> 17
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<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 17
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8

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<210> 18
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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 19
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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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<210> 20
<211> 552
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<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

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ggtgttcctg gccagaacac aggaggacag gtaagattgg gagacccttt gacattggag   180
caaggcgctc aagaagttag agaaggtgac ggtacaaggg tctcagaaat taactactgg   240
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<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide
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9

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<210> 22
<211> 40
<212> DNA
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<220>
<223> Description of Artificial Sequence: Synthetic
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<210> 23
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<210> 24
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
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<400> 24
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<210> 25
<211> 40
<212> DNA
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<220>
<223> Description of Artificial Sequence: Synthetic
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<210> 26
<211> 40

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<210> 27
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
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<400> 27
agtaggccgc ctcggccgcc cgggcatca                                       29


<210> 28
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
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<400> 28
tgatgcccgg gcggccgagg cggcctact                                       29


<210> 29
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 29
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<210> 30
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
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11

<400> 30
tgcgtagcta gcctcccggt ggtgggtcgg tg   32

<210> 31
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 31
agcagtagat ctggggttgg ggttgcgcct tt   32

<210> 32
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 32
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<210> 33
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<220>
<223> Description of Artificial Sequence: Primer

<400> 33
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<210> 34
<211> 33
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<220>
<223> Description of Artificial Sequence: Primer

<400> 34
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<210> 35
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<223> Description of Artificial Sequence: Primer

<400> 35
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<210> 36
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<220>
<223> Description of Artificial Sequence: Primer

<400> 36
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<210> 37
<211> 32
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<213> Artificial Sequence

<220>
<223> Desription of Artificial Sequence: Primer

<400> 37
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<210> 38
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 38
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<210> 39
<211> 515
<212> DNA
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<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

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gggggaccag tggtgccgcg tgctgagaca gtccctgccc gaggagaaga ttcctagcca   180
gacctgcatc gccagaagac acctcggccc cggtcccacc cagcacacac cctccagaag   240
ggataggtgg attaggggcc agattttgca agccgaggtc ctccaagaaa ggctggaatg   300
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13

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gagaattagg ggcgtgcaac aagccgctaa agagctggga gaggtgaatc gcggcatctg    360
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      oligonucleotide

<400> 40
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<210> 41
<211> 18
<212> DNA
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<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 41
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<210> 42
<211> 16
<212> DNA
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<220>
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      oligonucleotide

<400> 42
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<210> 43
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      oligonucleotide

<400> 43
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```
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<220>
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<223> The sequence of the EIAV gag/pol ORF is inserted
      between these bases

<400> 44
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<210> 45
<211> 10384
<212> DNA
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tgatatcgcc attttttccaa aagtgatttt tgggcatacg cgatatctgg cgatagcgct     240
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15

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16

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19

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27

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28

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ttcctttttc aatattattg aagcatttat cagggttatt gtctcatgag cggatacata 5940
tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg 6000
ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc 6060
acgaggccct ttcgtctcgc gcgtttcggt gatgacggtg aaaacctctg acacatgcag 6120
ctccccggaga cggtcacagc ttgtctgtaa gcggatgccg ggagcagaca agcccgtcag 6180
ggcgcgtcag cgggtgttgg cgggtgtcgg ggctggctta actatgcggc atcagagcag 6240
attgtactga gagtgcacca tatggacata ttgtcgttag aacgcggcta caattaatac 6300
ataaccttat gtatcataca catacgattt aggtgacact atagaactcg actctagagt 6360
ccgttacata acttacggta aatggcccgc ctggctgacc gcccaacgac ccccgcccat 6420
tgacgtcaat aatgacgtat gttcccatag taacgccaat agggactttc cattgacgtc 6480
aatgggtgga gtatttacgg taaactgccc acttggcagt acatcaagtg tatcatatgc 6540
caagtacgcc ccctattgac gtcaatgacg gtaaatggcc cgcctggcat tatgcccagt 6600
acatgacctt atgggacttt cctacttggc agtacatcta cgtattagtc atcgctatta 6660
ccatggtgat gcggttttgg cagtacatca atgggcgtgg atagcggttt gactcacggg 6720
gatttccaag tctccacccc attgacgtca atgggagttt gttttggcac caaaatcaac 6780
gggactttcc aaaatgtcgt aacaactccg ccccattgac gcaaatgggc ggtaggcgtg 6840
tacggtggga ggtctatata agcagagctc gtttagtgaa ccgcgccagt cttccgatag 6900
actgcgtcgc ccgggtaccc gtattcccaa taaagcctct tgctgtttgc atccgaatcg 6960
tggtctcgct gttccttggg agggtctcct ctgagtgatt gactacccac gacggggtc  7020
```

```
tttcatttgg gggctcgtcc gggatttgga gacccctgcc cagggaccac cgacccacca      7080
ccgggaggta agctggccag caacttatct gtgtctgtcc gattgtctag tgtctatgtt      7140
tgatgttatg cgcctgcgtc tgtactagtt agctaactag ctctgtatct ggcggacccg      7200
tggtggaact gacgagttct gaacacccgg ccgcaaccct gggagacgtc ccagggactt      7260
tgggggccgt ttttgtggcc cgacctgagg aagggagtcg atgtggaatc cgaccccgtc      7320
aggatatgtg gttctggtag gagacgagaa cctaaaacag ttcccgcctc cgtctgaatt      7380
tttgctttcg gtttggaacc gaagccgcgc gtcttgtctg ctgcagcgct gcagcatcgt      7440
tctgtgttgt ctctgtctga ctgtgtttct gtatttgtct gaaaattagg gccagactgt      7500
taccactccc ttaagtttga ccttaggtca ctggaaagat gtcgagcgga tcgctcacaa      7560
ccagtcggta gatgtcaaga agagacgttg g                                    7591
```

<210> 58
<211> 2870
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 58
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gctagcataa cttcgtataa tgtatgctat acgaagttat tctagagaac catcagatgt       60
ttccagggtg ccccaaggac ctgaaatgac cctgtgcctt atttgaacta accaatcagt      120
tcgcttctcg cttctgttcg cgcgcttctg ctccccgagc tcaataaaag agcccacaac      180
ccctcactcg gggcgccagt cctccgattg actgagtcgc ccgggtaccc gtgtatccaa      240
taaaccctct tgcagttgca tccgacttgt ggtctcgctg ttccttggga gggtctcctc      300
tgagtgattg actacccgtc agcggggtc tttcatttgg gggctcgtcc gggatcggga      360
gaccctgcc cagggaccac cgacccacca ccgggaggta agctggctgc ctcgcgcgtt      420
tcggtgatga cggtgaaaac ctctgacaca tgcagctccc ggagacggtc acagcttgtc      480
tgtaagcgga tgccgggagc agacaagccc gtcagggcgc gtcagcgggt gttggcgggt      540
gtcggggcgc agccatgacc cagtcacgta gcgatagcgg agtgtatact ggcttaacta      600
tgcggcatca gagcagattg tactgagagt gcaccatatg cggtgtgaaa taccgcacag      660
atgcgtaagg agaaaatacc gcatcaggcg ctcttccgct tcctcgctca ctgactcgct      720
gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt      780
atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc      840
caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga      900
gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata      960
ccaggcgttt cccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac     1020
cggatacctg tccgccttc tcccttcggg aagcgtggcg ctttctcata gctcacgctg     1080
taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaacccc     1140
cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag     1200
acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt     1260
aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta gaaggacagt     1320
atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg     1380
atccggcaaa caaaccaccg ctggtagcgg tggttttttt gtttgcaagc agcagattac     1440
gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca     1500
gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac     1560
ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac     1620
ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt     1680
tcgttcatcc atagttgcct gactccccgt cgtgtagata actacgatac gggagggctt     1740
accatctggc cccagtgctg caatgatacc gcgagaccca cgctcaccgg ctccagattt     1800
atcagcaata aaccagccag ccggaagggc cgagcgcaga agtggtcctg caactttatc     1860
cgcctccatc cagtctatta attgttgccg ggaagctaga gtaagtagtt cgccagttaa     1920
tagtttgcgc aacgttgttg ccattgctgc aggcatcgtg gtgtcacgct cgtcgtttgg     1980
tatggcttca ttcagctccg gttcccaacg atcaaggcga gttacatgat ccccccatgtt     2040
gtgcaaaaaa gcggttagct ccttcggtcc tccgatcgtt gtcagaagta agttggccgc     2100
agtgttatca ctcatggtta tggcagcact gcataattct cttactgtca tgccatccgt     2160
```

51

```
aagatgcttt tctgtgactg gtgagtactc aaccaagtca ttctgagaat agtgtatgcg   2220
gcgaccgagt tgctcttgcc cggcgtcaac acgggataat accgcgccac atagcagaac   2280
tttaaaagtg ctcatcattg gaaaacgttc ttcggggcga aaactctcaa ggatcttacc   2340
gctgttgaga tccagttcga tgtaacccac tcgtgcaccc aactgatctt cagcatcttt   2400
tactttcacc agcgtttctg ggtgagcaaa aacaggaagg caaaatgccg caaaaaaggg   2460
aataagggcg acacggaaat gttgaatact catactcttc cttttcaat attattgaag     2520
catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt agaaaaataa   2580
acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct aagaaaccat   2640
tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc gtcttcaaga   2700
attcatacca gatcaccgaa aactgtcctc caaatgtgtc cccctcacac tcccaaattc   2760
gcgggcttct gcctcttaga ccactctacc ctattcccca cactcaccgg agccaaagcc   2820
gcggcccttc cgtttctttg cttttgaaag accccacccg taggtggcaa               2870
```

<210> 59
<211> 3097
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 59
```
gctagcttaa gtaacgccat tttgcaaggc atggaaaaat acataactga gaatagagaa     60
gttcagatca aggtcaggaa cagatggaac agctgaatat gggccaaaca ggatatctgt    120
ggtaagcagt tcctgccccg gctcagggcc aagaacagat ggaacagctg aatatgggcc    180
aaacaggata tctgtggtaa gcagttcctg ccccggctca gggccaagaa cagatggtcc    240
ccagatgcgg tccagccctc agcagtttct agagaaccat cagatgtttc cagggtgccc    300
caaggacctg aaatgaccct gtgccttatt tgaactaacc aatcagttcg cttctcgctt    360
ctgttcgcgc gcttctgctc cccgagctca ataaagagc ccacaacccc tcactcgggg     420
cgccagtcct ccgattgact gagtcgcccg ggtacccgtg tatccaataa accctcttgc    480
agttgcatcc gacttgtggt ctcgctgttc cttgggaggg tctcctctga gtgattgact    540
acccgtcagc gggggtcttt catttggggg ctcgtccggg atcgggagac ccctgcccag    600
ggaccaccga cccaccaccg ggaggtaagc tggctgcctc gcgcgtttcg gtgatgacgg    660
tgaaaacctc tgacacatgc agctcccgga cacggtcaca gcttgtctgt aagcggatgc    720
cgggagcaga caagcccgtc agggcgcgtc agcgggtgtt ggcgggtgtc ggggcgcagc    780
catgacccag tcacgtagcg atagcggagt gtatactggc ttaactatgc ggcatcagag    840
cagattgtac tgagagtgca ccatatgcgg tgtgaaatac cgcacagatg cgtaaggaga    900
aaataccgca tcaggcgctc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt    960
cggctgcggc gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca   1020
ggggataacg caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa   1080
aaggccgcgt tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat   1140
cgacgctcaa gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc   1200
cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc   1260
gcctttctcc cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt   1320
tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt tcagcccgac   1380
cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg   1440
ccactggcag cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca   1500
gagttcttga agtggtggcc taactacggc tacactagaa ggacagtatt tggtatctgc   1560
gctctgctga agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa   1620
accaccgctg gtagcggtgg tttttttgtt tgcaagcagc agattacgcg cagaaaaaaa   1680
ggatctcaag aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac   1740
tcacgttaag ggattttggt catgagatta tcaaaaagga tcttcaccta gatccttta    1800
aattaaaaat gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt   1860
taccaatgct taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata   1920
gttgcctgac tccccgtcgt gtagataact acgatacggg agggcttacc atctggcccc   1980
agtgctgcaa tgataccgcg agacccacgc tcaccggctc cagatttatc agcaataaac   2040
```

```
cagccagccg gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag    2100
tctattaatt gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac    2160
gttgttgcca ttgctgcagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc    2220
agctccggtt cccaacgatc aaggcgagtt acatgatccc ccatgttgtg caaaaaagcg    2280
gttagctcct tcggtcctcc gatcgttgtc agaagtaagt tggccgcagt gttatcactc    2340
atggttatgg cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct    2400
gtgactggtg agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc    2460
tcttgcccgg cgtcaacacg ggataatacc gcgccacata gcagaacttt aaaagtgctc    2520
atcattggaa aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc    2580
agttcgatgt aacccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc    2640
gtttctgggt gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaat aagggcgaca    2700
cggaaatgtt gaatactcat actcttcctt tttcaatatt attgaagcat ttatcagggt    2760
tattgtctca tgagcggata catatttgaa tgtatttaga aaaataaaca aataggggtt    2820
ccgcgcacat ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca    2880
ttaacctata aaaataggcg tatcacgagg ccctttcgtc ttcaagaatt cataccagat    2940
caccgaaaac tgtcctccaa atgtgtcccc ctcacactcc caaattcgcg ggcttctgcc    3000
tcttagacca ctctacccta ttccccacac tcaccggagc caaagccgcg gcccttccgt    3060
ttctttgctt ttgaaagacc ccacccgtag gtggcaa                            3097
```

<210> 60
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 60
```
ggctagagaa ttccaggtaa gatgggcgat cccctcacct gg                         42
```

<210> 61
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 61
```
ttgggtactc ctcgctaggt tc                                              22
```

<210> 62
<211> 8
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 62
```
caggtaag                                                               8
```

```
<210> 63
<211> 512
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 63
cgcccgaaca gggacctgag aggggcgcag accctacctg ttgaacctgg ctgatcgtag    60
gatccccggg acagcagagg agaacttaca gaagtcttct ggaggtgttc ctggccagaa   120
cacaggagga caggtaagat gggagaccct ttgacatgga gcaaggcgct caagaagtta   180
gagaaggtga cggtacaagg gtctcagaaa ttaactactg gtaactgtaa ttgggcgcta   240
agtctagtag acttatttca tgataccaac tttgtaaaag aaaaggactg gcagctgagg   300
gatgtcattc cattgctgga agatgtaact cagacgctgt caggacaaga aagagaggcc   360
tttgaaagaa catggtgggc aatttctgct gtaaagatgg gcctccagat taataatgta   420
gtagatggaa aggcatcatt ccagctccta agagcgaaat atgaaaagaa gactgctaat   480
aaaaagcagt ctgagccctc tgaagaatat ct                                 512


<210> 64
<211> 514
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 64
cgcccgaaca gggacctgag aggggcgcag accctacctg ttgaacctgg ctgatcgtag    60
gatccccggg acagcagagg agaacttaca gaagtcttct ggaggtgttc ctggccagaa   120
cacaggagga caggtaagat tgggagaccc tttgacattg gagcaaggcg ctcaagaagt   180
tagagaaggt gacggtacaa gggtctcaga aattaactac tggtaactgt aattgggcgc   240
taagtctagt agacttattt catgatacca actttgtaaa agaaaaggac tggcagctga   300
gggatgtcat tccattgctg gaagatgtaa ctcagacgct gtcaggacaa gaaagagagg   360
cctttgaaag aacatggtgg gcaatttctg ctgtaaagat gggcctccag attaataatg   420
tagtagatgg aaaggcatca ttccagctcc taagagcgaa atatgaaaag aagactgcta   480
ataaaaagca gtctgagccc tctgaagaat atct                               514


<210> 65
<211> 522
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      oligonucleotide

<400> 65
cgcccgaaca gggacctgag aggggcgcag accctacctg ttgaacctgg ctgatcgtag    60
gatccccggg acagcagagg agaacttaca gaagtcttct ggaggtgttc ctggccagaa   120
cacaggagga caggtaagat tgggagaccc tttgacattg gagcaaggcg ctcaagaagt   180
tagagaaggt gacggtacaa gggtctcaga aattaactac tggtaactgt aattgggcgc   240
taagtctagt agacttattt cattgatacc aactttgtaa aagaaaagga ctggcagctg   300
agggattgtc attccattgc tggaagattg taactcagac gctgtcagga caagaaagag   360
```

```
aggcctttga aagaacattg gtgggcaatt tctgctgtaa agattgggcc tccagattaa      420
taattgtagt agattggaaa ggcatcattc cagctcctaa gagcgaaata ttgaaaagaa      480
gactgctaat aaaaagcagt ctgagccctc tgaagaatat ct                        522
```